

compounds having astringent, bitter notes (Group 12);  
compounds having the taste impression sweet (Group 13); and  
compounds having a glutamate-like taste impression (umami)  
(Group 14);

(c) preparing a first artificial cheese flavoring component comprising volatile compounds of Groups 1-9 in proportions corresponding to the detected amounts, and

(d) preparing a second artificial cheese flavoring component comprising non-volatile compounds of Groups 10-14 in proportions corresponding to the detected amounts.

54. A method as in Claim 53, wherein said testing involves determining odor active values (OAV) and disregarding any values of less than one.

55. A method as in Claim 53, wherein said testing involves determining taste active values (TAV) and disregarding any values of less than one.

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**REMARKS**

Entry of Amendment B, entry of the above new claims 30-55, and review and reconsideration of the Office Action of November 4, 2002, is respectfully requested in view of the above amendments and the following remarks.

New claim 29 finds support at page 5, lines 21-22 and the examples.

New claim 30 finds support at page 11, first paragraph and in the Examples.

It is respectfully submitted that the prior art does not

teach a "two component" cheese flavoring, and that such is not inherent in natural cheeses. Further, the prior art does not teach a system for producing such a two component flavoring, comprising testing a sample for each of 14 categories of components and then assembling first and second components (comprising taste active and odor active substances, but not other components which do not contribute to the cheese flavor (fillers, textures, etc)).

The present invention makes it possible, using a simple checklist of only essential components, to reliably compose a wide variety of cheese flavors. Non-essential components are eliminated from this list. As indicated at the top of page 16 of the specification, "The inventive cheese flavorings surprisingly enable the preparation of all flavors typical of a variety without being bound to constituents which do not contribute to the taste sensation "cheese".

No prior art references teaches how to prepare a cheese flavoring for any cheese variety without constituents which do not contribute to the taste sensation "cheese".

In the present invention, this is done by determining the concentrations of each of the presently listed 14 categories of odor-active substances and taste-active substances in a particular cheese variety using analytical methods (specification, page 11, first paragraph). The substances which are important for cheese flavoring are selected by determining the so-called odor active values (OAV) and taste active values (TAV). All substances having OAVs and TAVs greater than one, obtained from the quotient of the respective concentration of a compound and the corresponding threshold value in a relevant matrix in water, are taken into account for quantitative matching with flavoristic methods. Based

on the results of the analysis in each of the 14 categories, organoleptic substances are mixed in the determined amounts to produce a cheese flavor corresponding to the desired target cheese.

Using this system, cheddar and parmesan cheese flavorings were prepared in the specification.

It is noted, as pointed out by the Examiner, that the lower ranges of certain classes of components may be "0". The Examiner thus reads the claim as requiring not 14 ingredients, but only 10 ingredients.

In response, Applicants point out that the quantities of ingredients are selected based upon the analytical determination of the target cheese flavor to be reproduced. Thus, if the target cheese flavor contains any ingredients in groups 6, 9, 13 or 14, then the cheese flavoring produced in accordance with the present invention will contain an amount of such an ingredient. If the analysis of the target cheese flavor determines that there is no ingredient in one or more of groups 6, 9, 13 or 14 in the target cheese, then the cheese flavoring produced in accordance with the invention may also be free of these ingredients.

No prior art teaches the system of the present invention.

**Kubickova et al.**

This document does not provide any qualitative or quantitative details of non-volatile, taste-active compounds. The flavoring substances described are those typically used for soft cheese and they represent only a portion of those specified for the presently claimed cheese flavoring ingredient list.

**Preiningeretal.**

The volatile flavoring substances described in this document represent only some of the substances mentioned in the present claims. This is also true of the non-volatile, taste-active substances. Peptides are, for example, not mentioned at all in Preininger.

The corresponding quantities recited in the present claims are absolutely necessary for the production of the flavoring according to our invention. These groups are not mentioned in the above references. In addition, the various quantities mentioned in the references represent only a small portion of those mentioned in the present claims.

As far as salts are concerned, only some examples in Preininger are mentioned for the production of model solutions. Preininger does not contain any reference to the quantities employed or the use thereof for ready-to-eat foods. It only relates to model solutions.

Moreover, the list of groups of substances (1 to 14) and the corresponding quantities mentioned are absolutely necessary for the production of the flavoring according to the present invention. These groups are not mentioned in the above references. In addition, the various quantities mentioned in the references represent only a small portion of those mentioned in the present claims.

Consider for example the cheddar and parmesan cheese flavors produced in accordance with the present invention - the cited prior art does not teach a system for producing these or other flavors without inclusion of ingredients not essential for the flavor/taste sensation of the cheese variety.

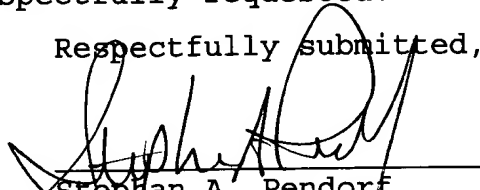
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Accordingly, withdrawal of the rejection and early issuance of the Notice of Allowance is respectfully requested.



Respectfully submitted,

  
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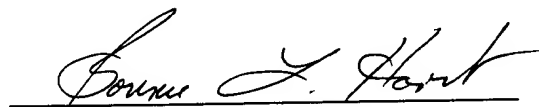
**EXPRESS MAIL CERTIFICATE**

"EXPRESS MAIL" MAILING LABEL NUMBER: **EV348894938US**

DATE OF DEPOSIT: **April 4, 2003**

I HEREBY CERTIFY that the foregoing **AMENDMENT C** for Patent Application No. **09/871,059** filed **May 31, 2001**, entitled "**CHEESE FLAVORINGS**" and a stamped receipt postcard are being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service under 37 C.F.R. §1.10 on the date indicated and is addressed: **ATTN: Box CPA, Honorable Commissioner of Patents and Trademarks, U.S. Patent and Trademark Office, Washington DC 20231.**

The Commissioner is hereby authorized to charge any additional fees, which may be required at any time during the prosecution of this application without specific authorization, or credit any overpayment, to Deposit Account Number 16-0877.

  
Bonnie L. Horst

**VERSION WITH MARKINGS TO SHOW CHANGES MADE HEREBY ATTACHED**

The Examiner is requested to accept the marked-up version as it is based on the previous version, which when modified as below, produces the clean version submitted with the current amendment.

**IN THE CLAIMS:**

Please cancel claims 1-28, maintain claim 29, and claim 30 as follows:

29. A two-component cheese flavoring comprising separate premix A and premix B:

- premix A) volatile component contents comprising
  - i) from 5 to 200 parts by weight of compounds having acidic and acetic-acid-like flavors (Group 1);
  - ii) from 0.1 to 10.0 parts by weight of compounds having milk-like and creamy flavors or cream-like or caramel-like flavors (Group 2);
  - iii) from 0.03 to 6.0 parts by weight of compounds having fruity and flowery flavors (Group 3);
  - iv) from 0.01 to 15.0 parts by weight of compounds having strong flavors, blue mold flavors and rind flavors (Group 4);
  - v) from 0.003 to 15.0 parts by weight of compounds having fatty flavors (Group 5);
  - vi) from 0 to 0.05 parts by weight of compounds having animal flavors (Group 6);
  - vii) from 0.0003 to 0.6 parts by weight of compounds having roasted flavors and cocoa-like flavors and also smoky flavors (Group 7);

viii) from 0.00005 to 0.1 parts by weight of compounds having vegetable-like flavors (Group 8);

ix) from 0 to 0.1 parts by weight of compounds having mushroom-like flavors or soft-cheese-like flavors (Group 9);

premix B) non-volatile component contents comprising:

i) from 100 to 480 parts by weight of compounds having the taste impression salty (Group 10);

ii) from 50 to 550 parts by weight of compounds having the taste impression sour (Group 11);

iii) from 5 to 200 parts by weight of compounds having astringent, bitter notes (Group 12);

iv) from 0 to 100 parts by weight of compounds having the taste impression sweet (Group 13); and

v) from 0 to 140 parts by weight of compounds having a glutamate-like taste impression (umami) (Group 14).

30. A two-component cheese flavoring as in Claim 29, wherein said cheese flavoring is Parmesan.

31. A two-component cheese flavoring as in Claim 29, wherein said cheese flavoring is cheddar.

32. A cheese flavoring according to Claim 29, wherein said compounds having acidic and acetic-acid-like flavors (Group 1) is selected from the group consisting of carboxylic acids having from 2 to 16 carbon atoms.

33. A cheese flavoring according to Claim 32, wherein said carboxylic acids having from 2 to 16 carbon atoms are selected from the group consisting of acetic acid, propionic acid, butyric

acid, valeric acid, caprylic acid, caproic acid, capric acid, lauric acid and myristic acid.

34. A cheese flavoring according to Claim 29, wherein said compounds having milk-like and creamy flavors or cream-like or caramel-like flavors (Group 2) are selected from the group consisting of saturated and unsaturated 5- and  $\gamma$ -lactone having 6 to 14 carbon atoms, hydroxy ketones and diketones having 4 to 8 carbon atoms and aromatic aldehydes.

35. A cheese flavoring according to Claim 34, wherein said saturated and unsaturated 5- and  $\gamma$ -lactone having 6 to 14 carbon atoms are selected from the group consisting of jasmine lactone, 5-decalactone, 8-octalactone, 5-undecalactone, 5-dodecalactone and 5-tetradecalactone and  $\gamma$ -caprolactone,  $\gamma$ -heptalactone,  $\gamma$ -octalactone,  $\gamma$ -decalactone and  $\gamma$ -dodecalactone.

36. A cheese flavoring according to Claim 29, wherein said compounds having fruity and flowery flavors (Group 3) are selected from the group consisting of ethyl, propyl and butyl esters of unbranched and branched carboxylic acids having 2 to 12 carbon atoms, saturated, unsaturated, unbranched and branched alcohols and aldehydes.

37. A cheese flavoring according to Claim 36, wherein said ethyl, propyl and butyl esters of unbranched and branched carboxylic acids having 2 to 12 carbon atoms are selected from the group consisting of ethyl propionate, ethyl butyrate, ethyl caprylate, ethyl caprate, ethyl caproate, ethyl isobutyrate, ethyl isovalerate and also propyl caprylate and butyl acetate.

38. A cheese flavoring according to Claim 36, wherein said saturated, unsaturated, unbranched and branched alcohols is selected from the group consisting of 2-pentanol, isoamyl alcohol, hexanol, methyl 2-methylbutyrate, 3-methyl-2-butanol and 2-phenylethyl alcohol.

39. A cheese flavoring according to Claim 36, wherein said aldehyde is selected from the group consisting of benzaldehyde, phenylacetaldehyde and (E)-2-phenylbutenal.

40. A cheese flavoring according to Claim 29, wherein said compounds having strong flavors, blue mold flavors and rind flavors (Group 4) are 2-alkanones and 2-alkanols having 5 to 12 carbon atoms.

41. A cheese flavoring according to Claim 40, wherein said 2-alkanones are selected from the group consisting of 2-pentanone, 2-heptanone, 2-octanone, 2-decanone and 2-nonanone.

42. A cheese flavoring according to Claim 40, wherein said 2-alkanols are selected from the group consisting of 2-heptanol and 2-nonanol.

43. A cheese flavoring according to Claim 29, wherein said compounds having fatty and creamy flavors (Group 5) are unbranched aliphatic aldehydes and alcohols having from 7 to 14 carbon atoms, unsaturated aldehydes having 8 to 15 carbon atoms and 2-alkanones having 6 to 16 carbon atoms and esters of long-chain unbranched fatty acids.

44. A cheese flavoring according to Claim 29, wherein said compounds having animal flavors (Group 6) are selected from the group consisting of nitrogen compounds, sulfur compounds, and branched fatty acids.

45. A cheese flavoring according to Claim 29, wherein said compounds having roasted flavors and cocoa-like flavors and also smoky flavors (Group 7) are selected from the group consisting of pyrazines which are monosubstituted or polysubstituted (monosubstituted to trisubstituted) with lower alkyl groups, branched aldehydes having 4 and 5 carbon atoms, phenols and alkylfurans.

46. A cheese flavoring according to Claim 29, wherein said compounds having vegetable-like flavors (Group 8) are selected from the group consisting of lower-alkyl-substituted thio compounds (1 to 4 carbon atoms), thiols and thioaldehydes.

47. A cheese flavoring according to Claim 29, wherein said compounds having mushroom-like flavors or soft-cheese-like flavors (Group 9) are selected from the group consisting of saturated and unsaturated alcohols and ketones having 8 carbon atoms.

48. A cheese flavoring according to Claim 29, wherein said compounds having the taste impression salty (Group 10) are salts having cations selected from the group consisting of sodium, ammonium, potassium, magnesium and calcium and anions such as chloride, hydrogen phosphate, dihydrogen phosphate, acetate and sulfate.

49. A cheese flavoring according to Claim 29, wherein said compounds having the taste impression sour (Group 11) are inorganic hydroxides.

50. A cheese flavoring according to Claim 29, wherein said compounds having astringent, bitter notes (Group 12) are selected from the group consisting of L-amino acids, peptides and unsaturated fatty acids having 16 to 22 carbon atoms.

51. A cheese flavoring according to Claim 29, wherein said compounds having the taste impression sweet (Group 13) are selected from the group consisting of carbohydrates and L-amino acids.

52. A cheese flavoring according to Claim 29, wherein said compounds having a glutamate-like taste impression (Group 14) are selected from the group consisting of L-amino acids and peptides based on amino acids.

53. A method for producing an artificial cheese flavoring, comprising:

(a) testing a sample cheese for the following volatile flavor components:

compounds having acidic and acetic-acid-like flavors (Group 1);

compounds having milk-like and creamy flavors or cream-like or caramel-like flavors (Group 2);

compounds having fruity and flowery flavors (Group 3);

compounds having strong flavors, blue mold flavors and rind flavors (Group 4);

compounds having fatty flavors (Group 5);

compounds having animal flavors (Group 6);

compounds having roasted flavors and cocoa-like flavors and also smoky flavors (Group 7);

compounds having vegetable-like flavors (Group 8);

compounds having mushroom-like flavors or soft-cheese-like flavors (Group 9);

(b) testing said sample cheese for the following non-volatile components:

compounds having the taste impression salty (Group 10);

compounds having the taste impression sour (Group 11);

compounds having astringent, bitter notes (Group 12);

compounds having the taste impression sweet (Group 13); and

compounds having a glutamate-like taste impression (umami) (Group 14);

(c) preparing a first artificial cheese flavoring component comprising volatile compounds of Groups 1-9 in proportions corresponding to the detected amounts, and

(d) preparing a second artificial cheese flavoring component comprising non-volatile compounds of Groups 10-14 in proportions corresponding to the detected amounts.

54. A method as in Claim 53, wherein said testing involves determining odor active values (OAV) and disregarding any values of less than one.

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55. A method as in Claim 53, wherein said testing involves determining taste active values (TAV) and disregarding any values of less than one.